

REMARKS

Claims 1-4 and 9-14 currently appear in this application. The Office Action of June 28, 2002, has been carefully studied. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicants respectfully request favorable reconsideration, entry of the present amendment, and formal allowance of the claims.

Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Egli et al.

This rejection is respectfully traversed. Egli et al. merely note that hydrogen-oxidizing, autotrophic, nitrate-reducing bacteria were obtained from a commercial groundwater-treatment plant. All that Egli et al. disclose is that groundwater can be treated with hydrogen-oxidizing, autotrophic, nitrate-reducing bacteria, and that these bacteria can be used to dehalogenate highly halogenated hydrocarbons. Egli et al. fail to describe what is claimed herein, namely, treating nitrate-contaminated water in a hydrogen-fed bioreactor with autotrophic, hydrogen-oxidizing, nitrate-reducing bacteria.

Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admission

as to the contents of a prior art publication, namely,  
Liessens et al.

This rejection is respectfully traversed.  
There is nothing in Liessens et al. that teaches or  
suggests treating nitrate-contaminated water in a  
hydrogen-fed bioreactor with autotrophic, hydrogen-  
oxidizing denitrifying bacteria.

Claim 2 is rejected under 35 U.S.C. 102(e) as  
being anticipated by Tanaka, the Examiner stating that  
the bacteria in Tanaka appear to be hydrogen-oxidizing  
denitrifying bacteria.

This rejection is respectfully traversed.  
While removing compost from treated contaminated water  
effects the physical removal of nitrates within the  
compost from the contaminated water, there is nothing in  
Tanaka that teaches or suggests removing nitrate from  
nitrate-contaminated water by treating the water in a  
hydrogen-fed bioreactor with autotrophic, hydrogen-  
oxidizing denitrifying bacterial. In fact, Tanaka adds  
nitrate ions to the sludge which is reduced to nitrogen  
gas to cause the sludge to float.

Claims 3 and 9-13 are rejected under 35 U.S.C.  
102(b) as being anticipated by Egli.

This rejection is respectfully traversed.  
Claims 3 and 9-13 all depend from claim 1. Claim 1

requires that the process be conducted in a hydrogen-fed bioreactor with autotrophic, hydrogen-oxidizing denitrifying bacteria. There is nothing in Egli et al. which discloses or suggests that the ground-water treatment plant included a hydrogen-fed bioreactor as required in the present invention.

Claims 3 and 9-13 are rejected under 35 U.S.C. 103(a) as being obvious over applicant's admissions as to the state of the prior art.

This rejection is respectfully traversed.

Assuming that the admission as to the state of the prior art was with respect to Liessens et al., it should be noted that there is nothing in Liessens et al. that teaches or suggests treating nitrate-contaminated water in a hydrogen-fed bioreactor with autotrophic, hydrogen-oxidizing denitrifying bacteria. Moreover, there is nothing in Liessens et al. that teaches or suggests the combination of the limitations of claim 1, namely, treating nitrate-contaminated water in a hydrogen-fed bioreactor with autotrophic, hydrogen-oxidizing bacteria, with the limitations in claims 9-14, namely:

a. that the bacteria use nitrate as a respiratory terminal electron acceptor to convert nitrate to nitrogen gas (claim 9);

b. that the bacteria are *Proteobacteria*

(claim 10);

c. that hydrogen gas is generated by corrosive oxidation of iron, biological fermentation, or electrolysis (claim 11);

d. that the bacteria are supported on a solid surface to support biofilm formation by the bacteria (claim 12);

e. that the water is percolated through a sand filtration unit after bacterial treatment (claim 13); and

f. that the water treated is drinking water (claim 14).

Claims 3 and 9-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanaka.

This rejection is respectfully traversed. While removing compost from treated contaminated water effects the physical removal of nitrates within the compost from the contaminated water, there is nothing in Tanaka that teaches or suggests removing nitrate from nitrate-contaminated water by treating the water in a hydrogen-fed bioreactor with autotrophic, hydrogen-oxidizing denitrifying bacterial. In fact, Tanaka adds nitrate ions to the sludge which is reduced to nitrogen gas to cause the sludge to float, whereas the present

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invention treats water which is originally contaminated  
with nitrate ion to remove the nitrate ion.

In view of the above, it is respectfully  
submitted that the claims are now in condition for  
allowance, and favorable action thereon is earnestly  
solicited.

Respectfully submitted,

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